Abstract of the disclosure

[038] An interface that allows a user to explore complex three dimensional datasets. The user manipulates a physical modeling material that defines the geometry of a surface that intersects a voxel dataset and the intersected voxel values are projected back onto the surface of the physical material as image data. A position sensor captures position data specifying the geometry of the surface, a processor compares the array of data values with the captured position data to identify selected ones of these data values whose position in the array corresponds to the geometry of the surface, and a projector for illuminates the surface with an image representative of the data at the array / surface intersection.